POJ Nursing Practice & Research

Research Article

Reducing the Use of Indwelling Urinary Catheters During Cesarean Deliveries

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Received Date: July 31, 2017 **Accepted Date:** August 21, 2017 **Published Date:** August 28, 2017

Citation: Michelle Borland (2017). Reducing the Use of Indwelling Urinary Catheters During Cesarean Deliveries. POJ Nurs Prac Res 1(2): 1-5.

Abstract

One concern for medical professionals and women experiencing cesarean deliveries is the use of indwelling urinary catheters, which is associated with a delay in first void time, slower ambulation time, increased discomfort, longer hospital stays, and an increased risk for urinary tract infections. The purpose of this project was to determine if a practice change regarding the use of urinary catheters among pregnant women decreases the number of women receiving a catheter prior to having a cesarean section in a small community hospital. The knowledge to action and Rosswurm and Larabee's models were used to guide this project, which was comprised of 2 phases. Phase 1 included a team of 10 experts that created the needs assessment that would establish hemodynamic stability using a 4-point scale. The items for inclusion in the needs assessment included primary cesarean, repeat cesarean, no urinary tract infection present, no fetal distress present, no systemic disorders present, no hypertensive disorders present, and no contraindications for anesthesia. Phase 2 was the implementation and evaluation of the needs assessment and new practice guidelines. Statistical analysis was performed using the Mann Whitney U test. There was 98% compliance ($p < 0.001$.) with the use of the assessment in women undergoing a cesarean delivery and a 64% reduction in the length of time an indwelling catheter was left in place. However, there was no significant change in the number of women receiving a catheter prior to cesarean delivery after a needs assessment was performed ($p = 0.805$). This project has potential implications that would support social change by reducing the use of indwelling catheters among hemodynamically stable women undergoing cesarean deliveries.

Key words: Indwelling catheter, Urinary catheter, Foley, Cesarean, C-section

Introduction

The history of cesarean delivery dates back to the time of Julius Caesar [1]. The purpose of a cesarean was to deliver an infant from women who were dying or who were already considered dead, in the attempt to save the unborn child. Roman law decreed that any woman fated to die before or during childbirth should be cut open, cesarean. Prior to the 16th century, the procedure was termed a cesarean operation, and Jacques Guillimeau published the change of terms, from cesarean operation to cesarean section, in a 1598 publication on midwifery [2]. It was not until the 19th century that the cesarean section (or C-section) was used to save a mother's life, as well as that of her infants [2].

The trend toward medically managed pregnancies and childbirth, which had accelerated quickly in the 1940s, gave rise to a new focus on women's health. Research flourished during that time with advances in anesthesia and care of the mother during cesarean deliveries [2]. With the rise in cesarean sections and the use of anesthesia during deliveries, medical practitioners identified complications from this type of delivery. Complications from cesarean deliveries include infections, longer hospital stays, delayed ambulation time, heavy blood loss, and blood clots [3].

Problem

The use of indwelling catheters prior to performing a cesarean delivery has become common practice among women having cesarean deliveries [4]. In the targeted organization, the use of indwelling catheters among women undergoing cesarean sections is 100%, regardless of need. The current guidelines in this hospital indicate that the catheter is left in place for 24 hours post delivery, first void time should occur within 6 hours after removal of the catheter, and ambulation of the patient occurs with the removal of the catheter at 24 hours post procedure. During the last quarter of 2014, all indwelling catheters were removed at 24 hours and first void time average

was 9 hours after removal. Ambulation time for patients with cesarean deliveries was greater than 24 hours post procedure. Moreover, the occurrence of UTIs associated with the use of indwelling catheters among women having a cesarean section was 9.6%, or 8 infections among 83 women with indwelling catheters.

CAUTIs are the second most common type of hospital-acquired infections (HAIs) and account for 15% of the infections that acute care hospitals have reported [5]. Urinary tract infections (UTIs) are the most common health care-associated infection reported to the National Healthcare Safety Network (NHSN), a tracking system for health care-associated infections that provides organizations with data to identify problem areas and measures progress of prevention efforts [5]. A major risk factor for acquiring a CAUTI is prolonged use of indwelling catheters. Therefore, catheters should only be used for appropriate situations and removed as soon as possible [5].

Urinary catheters should never be used for the convenience of staff or because of tradition. Current evidence-based guidelines have supported that the decision for a urinary catheter should be individual, based on the needs of the patient. During assessment of the patient and their need for a urinary catheter, the risk of catheter-associated urinary tract infection (CAUTI) should be considered. The use of indwelling catheters for cesarean births is associated with a delay in first void time, slower ambulation time, increased discomfort for the patient, longer hospitalization, and an increased risk for UTIs [3,6].

Purpose

The purpose of this project was to determine if a practice change regarding the use of urinary catheters among pregnant women decreases the number of women receiving a catheter prior to having a cesarean section in a small community hospital. The use of indwelling catheters prior to performing a cesarean delivery has become common practice among women having cesarean deliveries. In a small community hospital, the current policy regarding the placement of an indwelling catheter prior to a cesarean procedure has been in place for over 30 years.

Evidence

The use of a literature review supported and substantiated the translation of current evidence-based research into practice at a small community hospital. The literature review for this project included articles that examined the relationship between the use and nonuse of indwelling catheters during cesarean deliveries. This review was conducted to establish the most current evidence-based research available to translate the evidence into practice in a small community hospital in regards to the use of indwelling catheters during C-sections. The literature and guideline search was performed by utilizing the CDC website, Cochrane, Medline, National Guideline Clearinghouse, PubMed, EBSCO, and The Agency for Healthcare Research and Quality. The Medical Subject Headings (Mesh) terms used for the search were indwelling catheters,

catheters, Foleys, catheterizations, C-sections, cesarean delivery, and urinary tract infections. Article inclusion criteria included full-text, systematic reviews, randomized control trials, meta-analysis, English language, clinical guidelines, and articles published between the years 2009 and 2015. Only those articles that rated a high grade, using the GRADE system were determined to meet the inclusion criteria [7]. The GRADE methodology rates the quality of evidence on a scale of very low to high. The system begins with rating the type of research and then either downgrades or upgrades based on inconsistencies, size of sample, and the presence of biases [8]. The articles that met the inclusion criteria were randomized control studies with large sample sizes, no inconsistencies, and no biases present, rating them as high according to the GRADE system. The search resulted in 50 articles related to the criteria mentioned above. Of the 50 articles, 11 articles were found to be relevant and selected for the literature review.

The consistent findings from these articles, guidelines, and best practices suggest that there was evidence to support the implementation of catheter guidelines with women who undergo cesarean deliveries [3,6,9-13]. The nonuse of catheterization during C-sections was supported by improved patient outcomes such as improved ambulation time; earlier first void time; shorter hospital stays; and decreased UTI symptoms [3,6,12].

Support for changing patient guidelines was evident with improved postnatal activity when catheterization was not used during C-sections in hemodynamically stable women [9,10]. Improving patient experiences and outcomes has value to patients and organizations through the implementation of HCAHP (Hospital Consumer Assessment of Healthcare Providers) scoring, a survey instrument and data collection tool that measures a patients' perspective about their hospital care [14]. When catheterization is performed during a cesarean delivery, reducing the length of time it is left in place was supported by the evidence with a reduction in UTIs, decreased pain, earlier first void, and ambulation times [13]. General guidelines for the use of indwelling catheters support the use of nursing interventions to reduce utilization of indwelling catheters [15,16].

Methods

The translation of the evidence into practice was done through two phases. The first phase included presenting the evidence to an expert team and the establishment of practice changes and needs assessment. With the use of web learning and presentations, current evidence-based guidelines and practice change were shared with a team of experts. The team of content experts included obstetric physicians, staff nurses, manager, and unit director. During Phase I, the team of experts established new practice guidelines and a needs assessment using a 4-point scale. From this scale, the I-CVI and S-CVI were calculated.

The second phase was the implementation and evaluation of the practice guideline and needs assessment. The nurses on the obstetric unit were invited to attend an educational intervention or webinar review that was geared towards assessing the need to catheterize based on practice guidelines that were established by the content experts in Phase 1. Following the implementation of the practice change, a retrospective chart review was performed to extract data using a data collection form. Descriptive statistics were used to determine if there was a difference in the number of women who had an indwelling catheter inserted prior to a cesarean delivery.

Findings

A total of 10 content experts were invited to participate in the project. The members included four obstetric physicians, four charge nurses, one unit manager, and one unit director. All of the content experts were at least bachelor's-prepared and had 10 years of experience. The practice guideline was based on criteria for a hemodynamically stable obstetric patient [12]. The new practice guidelines were based on the current evidence regarding the use of indwelling catheters with hemodynamically stable patients prior to a cesarean delivery, as well as new guidelines for the length of time an indwelling catheter is left in place post procedure. The new guidelines stated that women preparing for a cesarean delivery should be assessed using the needs assessment; if an indwelling catheter is used, the physician must chart the reason for the catheter and the new orders state that it is to be removed within 8 hours

post procedure. If the catheter is left in longer than 8 hours, the new guideline states that the physician must chart the reason for leaving the catheter inserted and reassess frequently for removal of the catheter.

Eleven items were reviewed for the needs assessment tool and included primary cesarean delivery, repeat cesarean delivery, no UTI present, no vaginal bleeding present, no hypertensive disorders present, no systemic disorders present, no fetal distress present, no contraindications for anesthesia present, the patient's age, ethnicity, and the number of previous deliveries (Table 1). Each member from the expert panel ranked each item on a scale from 1 to 4, with 1 = not relevant; 2 = somewhat relevant; 3 = relevant; 4 = highly relevant. Primary cesarean sections, absence of fetal distress, absence of vaginal bleeding, absence of hypertensive disorders, absence of systemic disorders, and no contraindications for anesthesia scored a 4 from all experts and the I-CVI for each was a 1.0. Repeat cesarean section and the absence of a UTI scored a 3 or 4 from all experts and the I-CVI for each was a 1.0. Patient's age, ethnicity, and the number of previous births scored a 1 or 2 from all the experts and the I-CVI for each was a 0.0. The items that were included in the needs assessment each scored an I-CVI of 1.0 and those items that were excluded from the needs assessment tool scored an I-CVI of 0.0. On average, the I-CVI was 1.0 for those items that were included for the assessment tool to establish hemodynamic stability. The S-CVI score for the needs assessment tool was 0.73. (Table 1)

Table 1
Hemodynamic Data Collection

Criteria	Experts										I-CVI
	1	2	3	4	5	6	7	8	9	10	
Primary cesarean	4	4	4	4	4	4	4	4	4	4	1.0
Repeat cesarean	4	4	3	4	3	3	3	3	3	3	1.0
No UTI	4	4	3	3	3	3	3	3	4	4	1.0
No vaginal bleeding	4	4	4	4	4	4	4	4	4	4	1.0
No hypertensive disorders	4	4	4	4	4	4	4	4	4	4	1.0
No systemic disorders	4	4	4	4	4	4	4	4	4	4	1.0
No fetal distress	4	4	4	4	4	4	4	4	4	4	1.0
No contraindications for anesthesia	4	4	4	4	4	4	4	4	4	4	1.0
Patient's age	1	1	1	1	1	1	2	2	1	1	0.0
Ethnicity	1	1	1	1	1	1	1	1	1	1	0.0
Number of births	1	1	1	1	2	2	2	1	1	1	0.0
											S-CVI 0.73

Following the educational intervention, a retrospective chart review was completed in order to compare pre intervention and post intervention data. The pre intervention data included 27 cesarean deliveries with indwelling catheters being utilized

in all 27 cases and left in place for 24 hours post procedure. Post intervention, there were 53 cesarean deliveries. The average age was 26 (SD = 3.85) with a range of 20 to 37. Fifty-two of the women were assessed for hemodynamic stability and the need

for an indwelling catheter. One woman was not assessed due to an emergency situation where time did not allow for the needs assessment. Fifty of the 53 women (94.3%) received indwelling catheters and all catheters were removed within 8 hours of the procedure. Two of the women, who met the hemodynamically stable criteria, requested an indwelling catheter related to prior cesarean experience.

Chi-square was used to analyze post intervention data regarding whether there was a significant difference between the use of the new patient assessment tool and a reduction in the use of indwelling urinary catheters. A Mann Whitney U test was used for the p-value for analysis of the data for pre and post intervention as the two groups were independent of each other. There was no significant difference between those receiving a needs assessment and those who did not have an indwelling catheter inserted ($p = 0.805$). (Table 2) A statistically significant change ($p < 0.001$) in provider compliance was found as evidenced by a 98% compliance of the needs assessment. (Table 3) However, there was not a significant difference ($p = 0.685$) between those who received an indwelling catheter before and after the educational intervention. (Table 4) Although there was no significant reduction in the number of indwelling catheters inserted post assessment, there were new patient guidelines developed that reduced the length of time the catheter is left in place.

Table 2
Assessment and Catheters Post Intervention

	Assessed	Not Assessed	Total
Cathetered	49	1	50
Un-cathetered	3	0	3
Totals	52	1	53
<i>p</i> -value			$p = 0.805$

Table 3
Needs Assessment Pre and Post Intervention

Use of Needs Assessment	Before Educational Intervention (N = 27)	After Educational Intervention (N = 53)	<i>P</i> -value
No	27	1	< 0.001
Yes	0	52	< 0.001

Table 4
Indwelling Catheters Pre and Post Intervention

Use of Indwelling Catheter	Before Educational Intervention (N = 27)	After Educational Intervention (N = 53)	<i>P</i> -value
No	0	3	0.685
Yes	27	50	0.685

Implications

With the establishment of new guidelines for the use of indwelling catheters during and after cesarean deliveries, patient outcomes can be improved. Post intervention, 98% of the women undergoing cesarean deliveries was assessed. The dissemination of current research resulted in new practice guidelines that included a reduction in the length of time an indwelling catheter is in place post cesarean delivery. Although there was no significant reduction in the number of indwelling catheters inserted post assessment, there were new patient guidelines developed that reduced the length of time the catheter is left in place.

Recommendations

Routine placement of indwelling catheters among hemodynamically stable women undergoing cesarean delivery is not necessary. Moreover, those women needing catheterization should be selectively chosen through assessment and, when utilized, catheters should be used for shorter durations to provide quality patient care. However, to have better evaluation of the needs assessment and the use of indwelling catheters, larger sample sizes are needed.

Recommendations for further research are to focus upon patient outcomes from the reduction in time the indwelling catheter was left in place, such as effect on first void time, ambulation time, and patient satisfaction scores. The current literature supported the nonuse of indwelling catheters among hemodynamically stable women undergoing cesarean delivery and early removal of the catheter when used. Although there was not a significant change in reducing the use of indwelling catheters, there was a significant change in assessment for an indwelling catheter and a reduction in the length of time the catheter is left in place, which does follow current literature. The research supported the nonuse of indwelling catheters in women undergoing cesarean deliveries and this project supported that all women continue to have a needs assessment and, when it is established that the woman is hemodynamically stable, nonuse of an indwelling urinary catheter is considered.

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